

that of the bitumen called Asphaltum ; the resin being in the largest proportion, 100 grains affording 55 of resin, and 44 of asphaltum. Thus we have an instance of a substance found under circumstances which constitute a fossil, although the character of it partly appertains to the vegetable and partly to the mineral kingdom

In the concluding section the author enters into an inquiry on the action of alcohol on resins and bitumens. Its power of dissolving the former is well known ; but, contrary to the adopted opinion, he found that it also acted on bitumen, though indeed in a slight degree. His chief object was to ascertain whether a small portion of resin is contained in any of the bitumens, or, if not, to determine the nature of the substance which can be separated, although very sparingly, from those substances by digestion in alcohol. The results prove that the small portion which can be extracted from bitumen by digestion with alcohol is petroleum.

From a general view of the subject, the author thinks himself justified in asserting, that in bitumens the process of transformation appears to have been completed ; whereas in the Bovey coal, and especially in the substance which accompanies it, Nature seems to have performed only half of her work, and, from some unknown cause, to have stopped in the middle of her operations. By this circumstance, however, much light is thrown on the history of bituminous substances ; and the opinion that they owe their origin to the organized kingdoms of nature, and especially to the vegetable, which hitherto had been supported only by presumptive proofs, seems now to receive a full confirmation, although the causes which operate these changes on vegetable bodies are as yet undiscovered.

*On two Metals, found in the black Powder remaining after the Solution of Platina.* By Smithson Tennant, Esq. F.R.S. Read June 21, 1804. [*Phil. Trans.* 1804, p. 411.]

From a few experiments the author made in the course of last summer on this powder, he concluded, that it does not, as was generally believed, consist chiefly of plumbago, but that it contains also some other unknown metallic ingredient. Since those experiments, two French chemists, Messrs. Descotils and Vauquelin, having likewise examined that substance, found the same new metal ; but neither of them observed that it contains moreover another metal different from any hitherto known.

The black powder used in the process, which is the subject of this paper, was obtained from platina carefully separated from all extraneous particles ; so that the above ingredients, if found, must have been contained in that metal.

The first set of experiments relates to the effects produced by this powder when alloyed with other metals. It combines readily with lead ; but the compound, even when the lead greatly predominates, is not very fusible. With bismuth, zinc, and tin, the effects are nearly similar ; but with copper, a strong heat produces a much more

intimate union. The union of this substance with silver and gold produced upon it very little alteration; but, what is most remarkable, it could not be separated from these metals by the usual processes of refining. The alloys retain a considerable share of ductility; and the colour of that which is alloyed with gold is not materially different from that of pure gold.

The next experiments relate to the analysis of the black powder, and the properties of the two metals which enter into its composition. The method of dissolving the powder was similar to that employed by M. Vauquelin, viz. by the alternate action of caustic alkali and of an acid. The acid solution was found to contain that particular metal which has been noticed by Descotils. And of this metal, a considerable number of characters are here described, in addition to those already mentioned by the French chemists.

As to the alkaline solution, which Vauquelin considered as containing a portion of oxide of chrome, it is observed, that though some kinds of platina may contain chrome, and of course exhibit a certain quantity of it in its black powder, yet the precipitate which, upon accurate investigation, is yielded by it affords a very volatile metallic oxide, which evidently has not the characteristic qualities of that metal. As it is expedient to assign a specific name to every new substance, our author wishes to distinguish this precipitate by the appellation of Osmium, from the strong smell it emits. After showing in what manner it may be expelled from the alkali by an acid, and obtained by solution with water and distillation, the author mentions many of its relative properties and characteristic qualities. The most striking test of this oxide, we are told, is the mixture of its solution with an infusion of galls, which presently produces a purple colour, and becomes soon after of a deep vivid blue. It parts freely with its oxygen to all metals excepting gold and platina.

*On a new Metal, found in crude Platina. By William Hyde Wollaston, M.D. F.R.S. Read June 21, 1804. [Phil. Trans. 1804, p. 419.]*

Dr. Wollaston having conceived an idea that, in addition to the two new metals the preceding paper states to have been discovered in platina, the fluid which remains after the precipitation of that metal by sal-ammoniac, and which is likely to contain the more soluble parts of the mineral, might, on further examination, be found to contain some other substance worthy of our attention; and, in fact, having instituted an accurate analysis, of which the present paper contains a full detail, he thinks he has proved the existence of another unknown metal, to which, for the sake of distinction, he ascribes the name of Rhodium, from the beautiful rose-colour of the salts containing it. In the course of his detail, he likewise states the results of various experiments, which, he says, have convinced him that the metallic substance which was last year announced to the public by the name of Palladium, is contained (though in very small proportion,) in the ore of platina.